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ABUNDANCE OF THE OGASAWARA BUZZARD ON CHICHIJIMA, THE PACIFIC OCEAN

TADASHI SUZUKI AND YUKA KATO
Department of Biological Science, Tokyo Metropolitan University, Minami-ohsawa 1-1, Hachi-ohji, Tokyo 192-0397, Japan

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The Ogasawara buzzard (*Buteo buteo toyoshimai*) is an insular subspecies of the Common Buzzard (*B. buteo*, Ornithological Society of Japan 1974, Brazil 1991, Monroe and Sibley 1993). It is endemic to the Ogasawara (Bonin) Islands, which lie about 1000 km south of Tokyo in the Pacific Ocean. It usually nests on rocky cliffs (Funatsu and Chiba 1991), although tree nesting has been recently reported (Takagi and Ueda 1998, Kato and Suzuki 1999). It differs from a nearest subspecies, *B. buteo japonicus*, because of its drab plumage with less brown on the uppers and its longer beak and shorter wings and tarsi (Momiyama 1927).

The Ogasawara buzzard is listed as an endangered species in Japan (Japan Environmental Agency 1998) because the population is so small. It is known to inhabit the two island groups of the Ogasawaras, Chichijima-retto, and Hahajima-retto (Brazil 1991), with total areas of 38.2 km^2 and 27.0 km^2, respectively (Ogasawara Natural Environmental Group 1992). Among the islands, Chichijima is the largest and probably supports the largest population of buzzards. It is also the most developed of the Ogasawara Islands with a human population of about 1900 in 1998. In the early 1990s, the number of pairs of Ogasawara buzzards on Chichijima was estimated to be

about 15 (Higuchi et al. 1988, Funatsu and Chiba 1991) but no recent estimates of the present population have been made. Here, we present the results of a study we undertook to estimate the number of pairs currently on Chichijima.

STUDY AREA

Chichijima is situated at 27°04′N and 142°13′E and is approximately 24 km^2 in area. Terrain on the island is steep with many mountain areas of volcanic origin but elevations do not exceed 326 m. There are many rocky coastal and mountain cliffs that provide potential nest sites for Ogasawara buzzards. Chichijima is generally covered with low vegetation and canopy trees consisting of native and introduced species do not exceed 15 m in height (Shimizu and Tabata 1991). About 73% of Chichijima is covered with regenerated native forests and scrubs, and the remaining 27% includes coastal forests, exotic low shrubs (*Leucaena leucocephala*) and grasses (*Stachytarpheta jamaicensis*), cultivated fields, crags, and village areas.

METHODS

We systematically searched Chichijima for Ogasawara buzzards in March, April, May, June, August, and December 1998 and February, March, April, and May 1999 (1–2 wk per mo) during which time at least one of us stayed on Chichijima. When buzzards were found, we recorded their numbers, spatial position, flight path, any social interactions, and other patterns of behavior. Whenever possible, buzzards were individually identified using plumage characteristics, plumage deficits or differing stages of plumage development. When necessary, we searched presumed territories to determine occupancy. In so doing, we considered two nonantagonistic adults inhabiting a putative territory to be a pair.

RESULTS AND DISCUSSION

We found a total of 28 territorial pairs and one unmated, territorial individual by March 1999 and reconfirmed their occupancy of territories in May 1999. The pairs were dispersed rather evenly in both native and introduced habitats. For 16 of the 28 pairs, breeding activity was confirmed either by observing deliveries of nesting materials to nests, adults attending nests, incubating adults, nestlings in nests, or fledglings in their territories. For the remaining eight pairs, neither attended nests nor fledglings were found; nevertheless, we suspected that they bred because we observed them either delivering prey to presumed nests, repeatedly visiting and leaving the same locations (probably nesting sites) on cliffs, or they showed aggressive or alert behavior when we entered their territories during the breeding season.

Our estimate of 28 pairs of Ogasawara buzzards on Chichijima was nearly twice that previously reported for the island (Suzuki 1982, Higuchi et al. 1988, Funatsu and Chiba 1991). However, a comparison of our data with previous reports indicated that the increase was mainly due to the fact that we surveyed the island more thoroughly. Therefore, it is unlikely that the population of buzzards on the island has increased in recent decades.

We estimated the density of the buzzard population on Chichijima to be approximately 1.2 pairs per km^2. Our density estimate was rather high compared to densities of other breeding populations of Common Buzzards. Densities up to 0.78 pairs per km^2 have been reported in wooded areas of middle Europe (Newton et al. 1982) but normally densities are <0.5 pairs per km^2 (Newton 1979, Newton et al. 1982, Dare and Barry 1990, Davis and Davis 1992, Halley 1993, Jedrejewski et al. 1994, Penteriani and Faivre 1997). Factors limiting raptor population are food supply, nest-site availability, and human intrusion (Newton 1991). No other raptors, excluding occasional visitors, inhabit Chichijima; therefore, the high density of Ogasawara buzzards on Chichijima may be due to the abundance of nest sites and the lack of competition from other raptors for food. It may also be due to the overall absence of human persecution.

The density of buzzards also appears to be high on other islands in Chichijima-retto and Hahajima-retto, although recent survey data are not available (Higuchi et al. 1988, Funatsu and Chiba 1991, Suzuki 1991). We estimated the total population of Ogasawara buzzards on the Ogasawara Islands to be only about 85 pairs using our density estimate of 1.2 pairs per km^2 on Ogasawara and a total area of potential habitat of 70.7 km^2 including Mukojima-retto, the third island group of the Ogasawaras. Further study is needed to better document the total population of Ogasawara buzzards, including nonterritorial individuals, and to determine its nesting ecology to insure the future conservation of the subspecies.

RESUMEN.—*Buteo buteo toyoshimai* es endémico a las Islas Ogasawara (Bonin), a 1000 km al sur de Japón. Investigamos el número de parejas de *Buteo buteo toyoshimai* en Chichijima (ca. 24 km^2), la isla más grande de las Ogasawara, en 1998–99. Veintiocho parejas fueron encontradas. Este estimativo fue el doble que el previamente reportado, probablemente debido a la búsqueda minuciosa hecha en la isla. La densidad de parejas (1.2 parejas por km^2) fue más alta en comparación con los valores de *Buteo buteo* reportados en otras partes del mundo.

[Traducción de César Márquez]

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